

PATENT SPECIFICATION

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(54) PROTEINACEOUS FOOD PRODUCT AND METHOD OF MANUFACTURE THEREFOR

(71) We, UNCLE BEN'S OF AUSTRALIA PTY. LTD., a Company incorporated under the laws of the Australian Capital Territory, of Box 153 P.O., Wodonga, Victoria 3690, Australia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a food product and to a method for its manufacture. In particular, it is directed to a meat-containing product which is especially adapted for feeding domestic animals such as cats and dogs. It is to be understood, however, that the product of this invention has many uses and is not restricted to use in animal foods as described above.

It is known that most of the meats and offals which are available for the manufacture of processed pet foods need to be ground before processing or they break down during heat processing even if they are chunky. There is therefore a need for chunky meat-containing materials for use in the manufacture of food products which have a chunky meat appearance, particularly canned foods for domestic animals. One approach to providing such materials is to form the raw materials such as meats and offals which are presently available into such chunky materials which, in addition, are heat stable.

It is an object of the present invention to provide a method for the manufacture of simulated meat chunks and meat balls which can be used in both canned and non-canned foods.

Several processes are known for the production of "formed" meat products which are capable of withstanding subsequent processing. These processes generally involve emulsification of materials containing animal proteins, formation of the emulsified material into chunks or ribbons and subsequently coagulation of the formed chunks or ribbons by heat, for example by blanching in hot water, frying in hot fat or baking in an oven. There are a number of disadvantages associated with these known

processes which include loss of water soluble proteins during blanching, a high fat pick up and water loss during frying and an excessively high water loss during baking.

Other known processes use the technique of extruding mixtures of vegetable proteins under high pressure and temperature, to obtain a textured chunk which in some respects resembles meat. The main disadvantage of this process is that the chunks consisting mainly of plant substances, have a low animal acceptance, especially by dogs and cats.

As will be apparent from the foregoing description, the known processes are based mainly on heat-setting of protein containing materials. This present invention provides a method of manufacturing a food product, especially a meat-containing product which is a cold forming, chemical method not requiring heating to form the desired chunky product. The product of this invention is not subjected to additional heat processing during formation and this results in increased animal acceptance. Even if the product is subsequently canned, it has been demonstrated that precooked meat products are of lower acceptance. The simple manufacturing method of this invention also enables retention of the soluble proteins in the starting materials and there is no loss of water holding capacity resulting from contraction of the protein structure which occurs on heating. After being processed with gravy and/or other meat products, the chunky food product is easily distinguished from the mass in which it is embedded due to the surface characteristics of the chunks. The chunks manufactured by this invention will not stick together with other meats or coagulated water soluble proteins. Finally, the products of this invention can be formed into a variety of characteristic shapes and these shapes are stable even when subsequently heat processed. Because of the simple nature of the method, equipment costs are minimal and use of expensive blanchers, ovens or high pressure extruder cookers is avoided.

According to the present invention, there

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is provided a method of cold forming a proteinaceous food product in the form of discrete shape-retaining pieces which comprises forming a finely divided mix or emulsion containing animal and/or vegetable proteinaceous materials, incorporating a water soluble alginate in said mix or emulsion, forming the said mix or emulsion into pieces of the desired shape and subsequently treating the formed pieces with an aqueous solution of a water soluble calcium salt.

It has been found that when utilising the method of this invention the water soluble alginate in the mix or emulsion reacts to room temperature with the calcium ions in the aqueous solution to form a heat stable calcium alginate gel. It thus follows that, unlike the known processes utilising heat coagulation which require raw materials with good binding properties, the present invention allows the use of any raw material, even meats or meat by-products which have no binding qualities whatsoever.

The mix or emulsion formed in accordance with this invention may contain animal protein materials such as raw and/or processed meat or meat by-products and/or vegetable protein materials, especially cereals and gluten. Preferably, both animal and vegetable protein materials are included in the mix or emulsion. Other materials and additives commonly incorporated in processed food products may be added as desired.

The water soluble alginate is preferably incorporated in the mix or emulsion at a concentration of 0.2% to 5.0% by weight and concentrations of 1.0% are found to be particularly suitable. The alginate may conveniently be sodium alginate.

After formation of the mix or emulsion into "chunks" or pieces of the desired shape, the pieces are treated with an aqueous solution of a water soluble calcium salt. In practice it is found convenient to place the formed pieces into a bath or spray of the solution to allow formation of the calcium alginate gel. Calcium chloride is a suitable water soluble salt and concentrations of this salt from 1% to 50% by weight, preferably 1% to 5%, are found to be effective.

The gel setting time depends on the volume-surface area ratio, on the alginate concentration and on the concentration of calcium ions in the solution. It is found, however, that the overall setting time may be reduced by adding an edible acid to the calcium ion-containing solution and a water insoluble calcium salt such as a calcium phosphate to the mix or emulsion. By way of example, citric acid in an amount of about 2% by weight may be added to the aqueous solution.

The gel setting time may also be reduced

by adding a sparingly soluble calcium salt such as calcium sulphate and/or calcium citrate to the mix or emulsion. The sparingly soluble calcium salt is believed to form a soft gel inside the product while the calcium ions in the bath form a strong skin outside sufficient to withstand rough production handling.

The invention is illustrated in the following examples, which are given by way of exemplification and are not intended to be limiting. All percentages are on a weight basis.

EXAMPLE I

9 meat mix or emulsion containing

Spleen	...	...	10%
Liver	...	...	5%
Minced Bone	...	...	60%
Cereals	...	...	9%
Gluten	...	...	5%
Sodium alginate	...	...	1%
Water and added dye	...	...	10%

was extruded, formed into chunk-like shapes and kept for 60 minutes in a 1% calcium chloride bath to allow the formation of the calcium alginate gel.

EXAMPLE II

A meat mix or emulsion identical to that of Example I was extruded into a 5% calcium chloride solution. A setting time of 15 minutes was needed to give a similar gel strength to that of the product of Example I.

EXAMPLE III

A meat mix or emulsion as in Example I also containing 0.5% of calcium phosphate was formed into chunks. The chunks were set to a gel strength similar to that of the products of Examples I and II in a 1% calcium chloride bath containing 2% citric acid within 15 minutes.

EXAMPLE IV

A mixture containing low heat-coagulable materials was formulated as follows:

Refined meat meal	...	30%
Gluten	...	5%
Cereals	...	5%
Sodium alginate	...	1%
Calcium citrate	...	0.5%
Water and added dye	...	58.5%

The mixture was extruded into the desired shape and kept for 1½ hours in a 5% calcium chloride bath, which resulted in a firmer gel strength desired for this type of meat chunk.

All meat chunks made in accordance with the Examples were canned and heat pro-

cessed without disintegrating. The canned products were fed to and readily accepted by dogs and cats.

- 5 It will be appreciated that many variations or modifications may be made to the specific preferred features described above without departing from the broad teachings of this invention. Such variations or modifications are intended to be encompassed within the scope of this invention.

WHAT WE CLAIM IS:—

- 15 1. A method of cold forming a proteinaceous food product in the form of discrete shape-retaining pieces which comprises forming a finely divided mix or emulsion containing animal and/or vegetable proteinaceous materials, incorporating
20 a water soluble alginate in said mix or emulsion, forming the said mix or emulsion into pieces of the desired shape and subsequently treating the formed pieces with an aqueous solution of a water soluble calcium salt.
25 2. A method according to Claim 1, wherein the water soluble alginate is incorporated in the mix or emulsion in a concentration of from 0.2 to 5.0% by weight.
30 3. A method according to Claim 1 or Claim 2, wherein the water soluble alginate is sodium alginate.
4. A method according to any one of Claims 1 to 3, wherein the formed pieces are
35 treated with an aqueous solution of calcium chloride.
5. A method according to Claim 4,

wherein the concentration of said aqueous solution of calcium chloride is from 1% to 50% by weight.

6. A method according to Claim 5, wherein the concentration of said aqueous solution of calcium chloride is from 1% to 5% by weight.

7. A method according to any one of Claims 1 to 6, wherein a water insoluble calcium salt is incorporated in said mix or emulsion and said aqueous solution of a water soluble calcium salt also contains an edible acid.

8. A method according to Claim 7, wherein said water insoluble calcium salt is calcium phosphate and edible acid is citric acid.

9. A method according to any one of Claims 1 to 8, wherein a sparingly soluble calcium salt is also incorporated in said mix or emulsion.

10. A method according to Claim 9, wherein said sparingly soluble calcium salt is calcium and/or calcium citrate.

11. A method of cold forming a proteinaceous food product in the form of discrete shape-retaining pieces according to Claim 1, substantially as hereinbefore described in any of the Examples.

12. A proteinaceous food product produced by a process according to any preceding claim.

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